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SMITHSONIAN INSTITUTION.
UNITED STATES NATIONAL MUSEUM.

ANTHROPOLOGY AT THE PARIS EXPOSITION
IN 1889.

BY

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THOMAS WILSON,
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Curator, Department of Prehistoric Anthropology.

From the Report of the National Museum for 1890, pages 641-680
(with Plates CLVII-CLXIII).

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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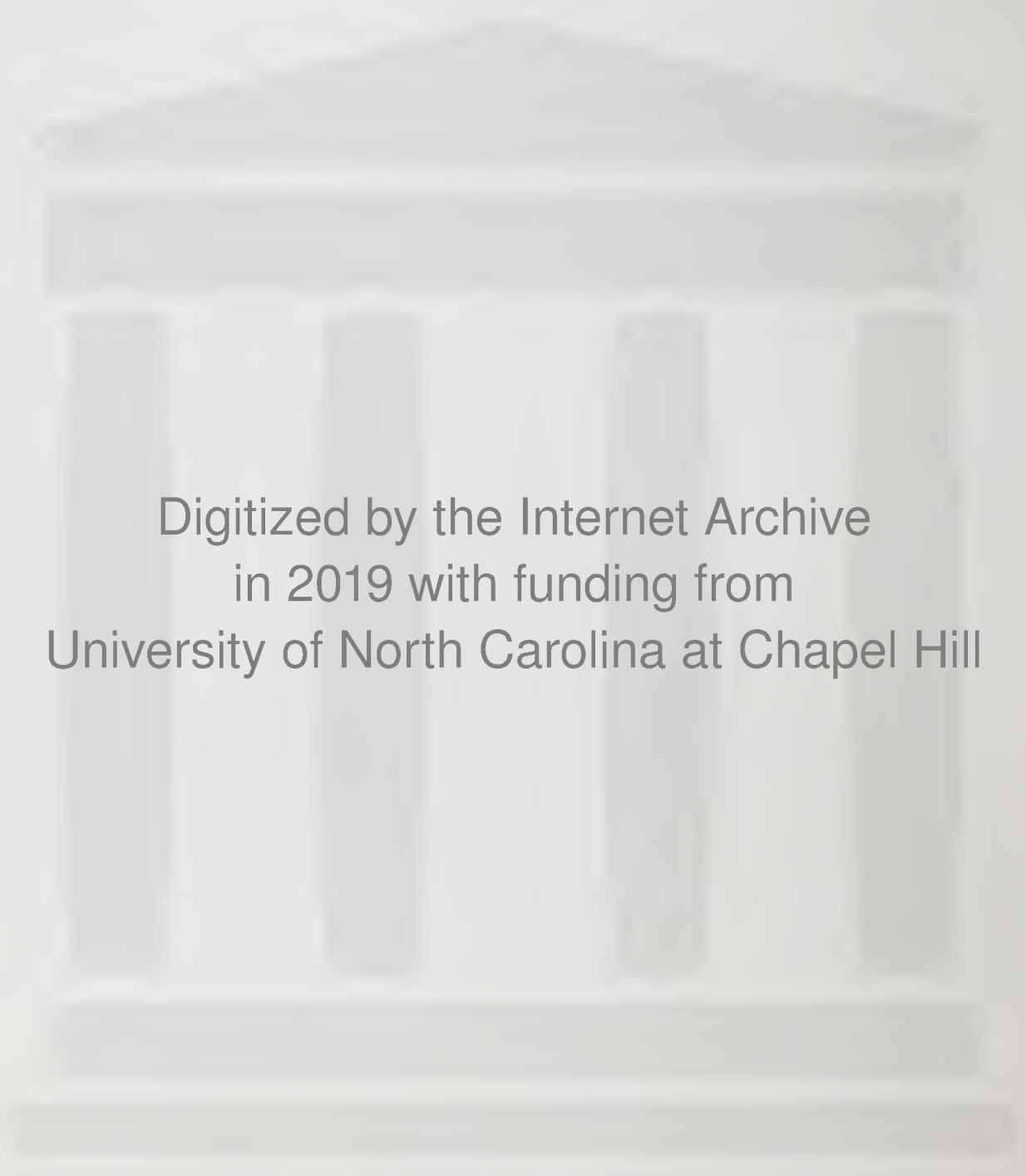
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ANTHROPOLOGY AT THE PARIS EXPOSITION IN 1889.

By THOMAS WILSON.

At the Exposition of 1867 in Paris there was little or no attempt to represent the science of anthropology. At the Exposition of 1878, however, an effort was made. M. Gabriel de Mortillet was director and the preparation of the display was given into his charge. A modest building was erected in the garden of the Trocadero Palace which was called the building of anthropology. The minister of commerce and agriculture took up the matter and lent his aid and confidence, and a creditable display was made. It was small, but quite complete and made a fair presentation of prehistoric anthropology. The societies and amateur collectors throughout France responded nobly to his appeal. I remember the elegant display made by Mr. Seidler, of the city of Nantes, who transferred his entire Scandinavian collection to Paris for use in this exposition.

But it was reserved for the Exposition Universelle of 1889 to make the grand display in regard to anthropology and its kindred sciences. Three exhibits were made. They were not the same, and one tended largely to supplement the other, making them, when taken in connection, a most elaborate, wonderful, and complete display.

The most extensive of the three was that under the direction of the minister of agriculture and commerce, and which formed section 1 of the *l'Histoire Retrospectif du Travail*. This had Drs. Topinard, Hamy, and M. Cartailhac for its directors and managers. The adjoining display was under the supervision of the minister of public instruction, and it had for its director the *Société d'Anthropologie* of Paris. The third was section 5 of the exposition *Retrospective du Travail*, consisting solely of prehistoric weapons, and was associated with the exhibit of arms in the building of the department of war on the Champ de Mars.

The French people or Government in all former expositions had made a principal feature of the display called *The History of Retrospective Labor* (*l'Histoire Retrospectif du Travail*). The Exposition of 1889 was not to be an exception. The grand commission superior of organization had Jules Simon, sénateur, a member of the academy, for its president, and twenty-five members which divided the display into five sections. (1) Anthropology and Ethnography; (2) Liberal Arts; (3) Art

and Trade; (4) Transportation, and, (5) Military Art. It was assigned the principal nave of the great building devoted to liberal art, or to that half of it north of the rotunda and towards the Seine.

SECTION I.—ANTHROPOLOGICAL DISPLAY.

It is only with the first section that I have to deal at present—the anthropologic sciences and ethnography. This was placed in the hands of a committee and again divided into three portions. Dr. Topinard had the principal direction of that portion relating to general anthropology with Dr. Magitot in charge of a subsection of criminal anthropology. M. Cartailhac to archæology and prehistoric anthropology. M. Hamy to ethnography. This division was one of theory and science more than of practice, for the objects themselves were not thus divided, and these gentlemen acted more as a committee than separately.

The following was the classification for the division of anthropology, archæology, and ethnography.

I.—ANTHROPOLOGY, UNDER DIRECTION OF DR. TOPINARD.

Pieces and specimens of comparative anatomy and embryogeny relative to man; casts of the brain; skulls and skeletons, and in their default casts; prehistoric skulls, trepanned skulls, and prehistoric pathologic specimens; casts of busts and typic masks of the living; instruments for physical and physiological observations; instruments of craniometry and anthropometry; charts showing the division and character of races; photographs of skulls and of ethnic types; composite photography.

II.—PREHISTORIC ARCHÆOLOGY, UNDER DIRECTION OF M. EMILE CARTAILHAC OF TOULOUSE.

Material for work and specimens representing the different phases of the fabrication of primitive instruments; chipping, polishing, perforation, etc., of objects of stone; work on bone and on the horn of ruminants; pieces which bear relation to the practice of art, of design, of drawing, etc.; primitive pottery; views and plans or models of habitations, funeral monuments, antiques, etc.; casting or hammering of metal, bronze, copper, iron; specimens of molds and objects of metal, cast or hammered; caches of the fondeur; origin of glass, enamel, etc.; terms of comparison borrowed from savage populations—fire making, fabrication of objects of stone, of wood, of bone, of pottery; comparative metallurgy.

III.—ETHNOGRAPHY AND CLASSIC ARCHÆOLOGY, UNDER DIRECTION OF DR. HAMY.

Dr. Hamy was assisted by several oriental travelers and scholars, MM. Maspero, Villefosse, Perrot, Solomon Reinach, and others. Its divisions were as follows:

RBC
NcU

Objects relative to the history of work in antiquity: Egypt, Assyria, Phenicia, Greece, the Roman Empire, and particularly Gaul, the extreme Orient, and the New World; models, plans, etc., and characteristic constructions; sculptures and paintings (originals and copies), reproducing the manual art; scientific apparatus and material for industrial art to the reign of Charlemagne; specimens representing the different phases of fabrication and collections of characteristic products.

I. GENERAL ANTHROPOLOGY.

The display of anthropology in general, was marvelous. A résumé of it shows that there were 115 busts or entire figures of races; 77 pieces or casts of brains; 15 of the hand; 234 human skulls or their casts, of which 48 were prehistoric or very ancient; a considerable number of paintings, charts, etc., these being all furnished by 71 persons, of which 24 came from foreign countries, among which are named Great Britain, the United States of America, Brazil, Germany, Austria, Norway, Denmark, Belgium, Switzerland, and Italy.

On entering the building of Liberal Arts from the side facing the Seine the first object which struck the eye in the section of the *Histoire Retrospectif du Travail* was a gigantic gilt statue of the Japanese Buddha—one of the grandest and largest known. It came from the city of Nara, which was in the eighth century the capital of Japan, and one of the great centers of the Buddhist religion.

“Derrière le Grand Buddha” was the place of rendezvous for all anthropologists during the Exposition. This was the entrance to the pavilion of anthropological science. To the right of the Grand Buddha were the three skeletons, in their original soil, found by Dr. Rivière in the Grotte of Mentone, near Nice, with whom I had formed an interesting acquaintance during my residence as consul at that point. The earth was cut around the sides and at the bottom so as to lift them without disturbance and then placed on blocks, and thus transported to Paris and are now here displayed. The larger and most important of these skeletons is that at the Jardin des Plantes, Paris. None of these have ever been disturbed or taken out of their native soil as found in the caves.

To the left were casts of the two Bushmen, who had been presented to the Société d'Anthropologie in October of 1886, in my presence. One of the men was afterwards cast in full life. He died one month after the casts were taken.

On the outside of the pavilion, to the right and left, respectively, of the Grand Buddha, were the two cases containing the objects from the United States transported to Paris by me. When the various congresses were in session during the Exposition and the members visited the anthropological section of the Exposition each exponent was expected to be at his respective place to show his objects, to make such explanations as might be needed, and answer such questions as might be put. I spent the principal or a large part of the time during the

weeks of the meeting of the Congress of Prehistoric Anthropology engaged in this and similar duties.

Entering the pavilion we come at once to the subject of anthropology and the anthropological sciences. Dr. Topinard attended on every other day, at 10 o'clock in the morning, to give instructions and answer questions. The public were invited to be present at the conferences, and they were attractive and interesting as well as instructive.

In the entrance to this pavilion was the exhibit of Mr. Carl Lumholtz, the Norwegian traveler and anthropological investigator in Australia and among the Australians. His display consisted of Indian relics from the mounds of Ohio and Minnesota.

Possibly no better understanding could be given of the science of anthropology, as it is taught in France, than by a description of the charts and tables displayed by Dr. Topinard and used by him before the École d'Anthropologie. The following were displayed:

- (1) Place of anthropology in science.
- (2) Place of man in the classification of mammals.
- (3) Genealogical tree of the animals up to man, according to Lamarck.
- (4) The distance of man from the anthropoides as determined by the weight of the brain and capacity of the skull.
- (5) Composite stereographic representation of different races.
- (6) An example of the variation of character in a single human group, taken from measurements of the cephalic index of 1,000 Parisians.
- (7) The average weight of brain of man in his ordinary condition but at different periods of his life.
- (8) The same, divided the same way, of men in peculiarly good condition, as of professional men, those of leisure, etc. The excess over the former is 10 per cent.
- (9) The same of woman. The difference against woman when compared with the ordinary man is 4 per cent.
- (10) The curved lines representing the average variation of the weight of the brain in man from 15 years of age until his death. Average taken from 1,551 cases.
- (11) Classification of the cephalic index by units and also by 5 units, according to the quinary nomenclature.

A series of anthropologic charts, sixteen in number, forming a single work, relative to the color of eyes and hair of persons in France, and giving full statistics.

There were the same kind of charts prepared by other persons. Drs. Collineau, Bertholon, and Lelarge, gave the division and classification for France, Tunis, and Corsica, showing the index cephalic, the nasal index, the height according to departments and given localities. All these showed the extremes as well as the average of each characteristic.

There was a chart of the same kind, showing the divisions of the Berber race in Tunis.

There were similar charts and statistics relating to Germany, by Dr. Schaaffhausen, of the University of Bonn; of A. B. Meyer, of Dresden. Prof. Virchow presented his great chart on the color of the eyes, hair, and skin of 2,000,000 of school children in Germany, taken during the year 1875, showing the percentage of blonds, of brunettes, of brown eyes to blue eyes, of brown hair to blond hair, and of gray eyes to light eyes.

There were also anthropologic charts from the British Islands, showing practically the same classifications, prepared by Dr. John Beddoe, of Bristol, England.

The same for Norway, by C. Arbo; of Switzerland, by Dr. Kollman.

Also ethnographic charts of Caucasus, by Monsieur Emil Chantre; of south oriental Europe and of Dobruša, by M. A. Rosny; of Asia, by M. Deniker, librarian at the Museum of Natural History, Paris, together with his proposed classifications of the human race based on their affinities and anthropologic characters. He groups the people of Asia into twenty-six grand divisions, and these again, according to locality, into two hundred peoples or tribes.

The two systems of representation were shown, that of Drs. Topinard and Beddoe, and the other that of Professor Virchow. The first was represented by the charts of Beddoe, Bertillon, Collineau, Arno, Arbo, and the other by the charts of Virchow and Kollman. In the first, adults only were reported; in the second, children.

The prehistoric skulls or their casts on exhibition numbered forty-eight. Among these were all the principal ones, or their duplicates, Neanderthal, Olmo, Canstadt, Brux, Mentone, Solutrê, Cro-Magnon, Langerie Basse, Spy, etc.

Those from Spy were taken from their pedestals and exhibited by their discoverers before the congress of anthropology, and the necessary descriptions were given.

Monsieur Tramont exhibited a series of comparative anatomy of vertebrate animals, consisting of thirteen skeletons. They were arranged to show the relationship between man and these animals, and, beginning with the higher and going downward, they were, a man, a chimpanzee, an ourang, a monkey of the ancient continent, one of the new continent, a limure, a bat, a lion, a kangaroo, a reptile, and two fish. Along with it was another series of five pieces showing the evolution of the brain from the fish to the man. The same of the foot and hand, showing the series from man down—five pieces. Another of the brain represented by twenty-six pieces, ten of which showed the structure of the brain, two its exterior part, and eleven its convolutions. Dr. Capitan presented an exceedingly interesting series relating to prehistoric trepanation. There were a number of prehistoric skulls bearing evidences of trepanation; one, a human, bore upon its right side a deep circular groove, from which the circular piece was intended to be taken out; another, a modern human skull, in which the processes of pre-

historic trepanation in its various stages were shown; the cut was made deep, then slighter, a portion of the rondelle taken out, and, finally, the entire piece. This operation was performed by Dr. Capitan to show how it might have been done in prehistoric times. The implements with which it was performed were all laid by the side of the skull. They were the knives and scrapers of sharp flint, pieces of wood and bone to support them, and by which the trepanned piece could be lifted out.

There were also skulls of dogs, one of which had been trepanned after death, another which had been trepanned during life, and lived three weeks. Again another which had the same operation performed and lived six months; another, six weeks. These dogs had all been cured of the operation and were in a situation to live as long as they might. They were then killed for the purpose of obtaining the information concerning the operation. The results were such as to show that the implements and instruments used produced a trepanation identical with those observed upon prehistoric skulls.

This display of Dr. Capitan would have warmed the hearts of our doctors at the Army Medical Museum if they could but have seen it.

It was supplemented and made much more interesting by nearly all the genuine and original trepanned skulls from France.

It goes without saying that this exposition was filled with all the necessary descriptive charts and casts, colored plates, characteristic subjects for study of anatomy and the human form, but they can not be mentioned here. There were extensive representations of the races and peoples of the islands of the Pacific and Indian Oceans.

Complete series of instruments of craniometry and anthropometry were exhibited; those by Mathieu, Collen, Tramont, Molteni, Colas, and Mr. Francis Galton, of Great Britain; also those by Dr. Gillet de Grandmont by Hamy of the Ethnographic Musée of the Trocadero, Demeny of the College de France, Dr. Luigi Anfosso, and others from Italy, and not to be forgotten was that of Dr. Benedikt of the University of Vienna. He has just published a work upon the subject of craniometry.

It has appeared to me fit in times past to criticise adversely the apathy, if not to say opposition, on the part of some of the people of the United States to the science of anthropometry. Anthropometry and craniology may not have been able to classify the races of men in either a perfect or approved manner, and so some of our anthropologists have been led to oppose it; but it is of such benefit and importance as that it ought not to be overlooked nor fall into disuse. I may be excused if I give a list of some of the instruments used for this purpose. I take the exhibit of Mr. Francis Galton. He has described his system and his instruments in the *Journal of the Anthropological Institute*, and I shall not repeat it.

I. Spirometre to measure the capacity of respiration.

II. Dynamometre for the hand.

III. Dynamometre for the arm.

IV. A series of colored wools to be used in testing the candidates in color-blindness.

V. A rule to determine the individual aptitude to measure and divide distances, to divide angles. Another to test the aptitude or capacity for judging of weight.

IX, X and XI. To test the capacity of the ear to detect differences in sound.

XII. An apparatus to measure an interval, and the difference in its detection between the eyes and the ear.

There was to be added to this list other instruments which were not present because of their weight and their not being necessary. The scales, the measure of height, the measure of the length of arm, the compass, and the models for establishing the colors of the eyes and hair.

With these instruments Mr. Galton established a laboratory of anthropometry at the health exposition of 1884 at London, and he used a formula of tables on which all these things were entered, and one copy kept and another given to the subject. I have one which I received from his laboratory on being measured myself, personally, at the British Association at Newcastle.

The display of M. Mathieu, a mathematical instrument maker on the Boulevard St. Germain, near to the École de Medicine, are those made after the system of Broca. The compass for measuring thicknesses having small balls upon the end, and the graduating arm marking millimetres; a sliding compass marked in the same way; divers gonio-metres; a craniostat, with its needles for measuring orbits; the endometre; the crochet occipital, and all the tropometre, the apparatus for taking the cubic contents of skulls.

Let no one think that even with all this apparatus he can measure skulls with accuracy or certainty until after he shall have had sufficient practice and instruction. I served in the Laboratoire d'Anthropologie, at Paris, practising upon the same skull for two weeks, the afternoon of each day, before I obtained sufficient degree of manipulation to be able to measure the same skull two times alike.

The apparatus in use in the police department by Alphonse Bertillon was also displayed by their maker, M. Colas. They consisted of (1) scale for measuring the height, standing; (2) scale for measuring the height, sitting; (3) scale for measuring the outstretched arm; (4) the compass of M. Bertillon, (5) the sliding compass to measure the elbow, length of the foot, palm of the hand; (6) small compass to measure the fingers and the ears.

The display of anthropometric instruments made by Dr. Topinard was more interesting as an illustrated history of the science than for actual use. He exhibited various kinds, the earliest ones that were

used, their changes, their improvements, etc.; the different methods of measuring skulls—that employed by MM. Ranke, Thann, Holder, Virchow, and, of course, Broca.

Dr. Hamy exhibited a set of anthropometric instruments packed for transportation. They were intended for travelers and to be used in measuring the living person, usually the savage among whom the traveler might pass. They consisted of the various compasses, the measures, etc., together with the tables that were to be used in transcribing them.

The Government of Denmark made a special exhibit at its own expense with its own officers in charge, working, of course, under the direction of the committee.

There was an extensive exhibit from Italy, but it pertained more to anthropology pure and simple, and its relation to crime.

Belgium was well represented, and her museums and societies and amateur collectors lent their objects quite freely and made an elaborate and extensive display, comprising the great discoveries of MM. Fraipont and Lohest in the Grotte de Spy relating to the paleolithic period.

Dr. Cunningham, from the medical college of the Dublin University, made a presentation of twenty pieces prepared by his process of freezing, similar to those now shown in the Army Medical Museum.

Probably the most important, the most unique and valuable contribution in relation to American prehistoric anthropology, was that made by the National Museum of Rio Janeiro, Brazil. It consisted of 9 skulls of prehistoric men, the chief among which was that of Lagoa Santa which was discovered now 15 or more years by Lund during his residence in that country, taken by him to Copenhagen, and lately published by Dr. Soren Hansen. Other prehistoric skulls of the same country and part of the same exposition were those from the shell-heaps of Parama, St. Catharine, etc.

The prehistoric man of Caucasus was represented by the collection of Monsieur Chantre, who has made such studies in that country, the results of which have been lately published in his extensive work.

The collection of M. H. H. Risley, director of the ethnographic service of Bengal, comprised about six hundred objects and gave as complete a representation of ethnography in India as was possible.

There were casts of fourteen skulls of Indians from North America. They were all of prisoners in Florida, and the casts were sent by the Smithsonian Institution.

PREHISTORIC ANTHROPOLOGY.

FRANCE—PALEOLITHIC PERIOD.

This division was under the special charge of M. Cartailhac. It was arranged by him, and was intended to be as complete an exposition of

their own country, France, as it was possible to make. M. Cartailhac classified it as follows :

The first period of the paleolithic age, the alluvium ; the second period of the paleolithic age, the caverns ; the neolithic period ; the age of metal, which he divided into Celtic and Gauloise periods, which brought it to the historic period, and there his display ended. The historical career of France was taken up in another section.

The display of prehistoric archæology was more extensive than one would suppose from the meager description I have been able to give. There were no less than eighty-five cases, tables, shelves, etc. All the epochs mentioned in the description were here displayed. They were divided among the paleolithic, neolithic, and bronze ages, though these were not in all cases kept separate, it being found impracticable to make the classification and divide the collection of each contributor. Making the rudest attempt at classification, I give the following :

TERTIARY.

[Collections of the Archæologic Society of Vendome. M. Ad. Arcelin, Macon.]

PALEOLITHIC.

Collections of—

- MM. Cunisset-Carnot, Dijon.
- M. E. Cartailhac, Toulouse.
- M. Marcellin Boule, Aurillac.
- M. E. Collin, Chelles.
- M. A. Nicaise, Chelles, Marne, Yonne, Aube, Moustier.
- M. Elie Massenat, Correze, Dordogne.
- M. Vanville, Cœuvres, Roche-Bertier, Charente.
- Madame Capitan, Vienne—Surface.
- M. Lejeune, Pas-de-Calais.
- M. Abbe Maillard, l'Erve.
- M. Maurice Feaux, Dordogne.
- M. Michel Hardy, Jean le Blanc, Bruniquel, Badegoule.
- M. Paignon, Montgandier.
- M. J. St. Venant, Jussy-Champagne, Cher.
- M. Cau-Durban, Haute-Garonne, Grotto de Forges near Bruniquel.
- Viscount de Lastic, Tarn-et-Garonne.
- M. Paysant, Grotte de Reilhac, Rossignol.
- M. Judge Piette, Mas d'Azil, Grotte Duruthy.

Several of these collections of paleolithic implements were from the surface, notably those of M. Cartailhac and Madame Capitan. More than one-half of them contain objects engraved or sculptured. The principal were those of Judge Piette, M. Massenat, Maurice Feaux, Michel Hardy, M. Paignon, M. Cau-Durban, M. Paysant, and Viscount de Lastic.

I can do no better in giving a description of this section of prehistoric archæology than to take a portion of M. Cartailhac's carefully digested and closely written introduction. He says :

The paleolithic period having endured for a long time, presents itself to us with various and successive aspects. The objects of industry, the most ancient of all Eu-

rope, are shown in the alluvium of the great rivers, on the shores of which lived our ancestors, having around them a magnificent fauna. Two species of elephants, two rhinoceros, and other animals that appear to have made their rendezvous from Asia and Africa on the territory of France. Secondary, flora to support the life of the various animals, which was made possible by warm and rainy climate. The man of this period is known to us, not by his bones, but only by his industry. We have his implements of chipped stone. The other matter employed in his tools and implements for his weapons were perishable, and thus have not left any record. The stone was chosen with care for that kind of work for which it was to be employed. They are, more than any, the flint, but in certain regions quartz, quartzite, and sandstone. The instruments have been made by chipping, and sometimes the first flakes were used and sometimes the block itself. They were sharpened on their edges and points by retouching, sometimes by shock and sometimes by pressure. It is not possible to distinguish the arms from the tools. The specimens vary much in form, size, and in the finish. Some of them are fashioned with art and delicacy.

This extremely interesting civilization reigned in a great part of the world. Its vestiges are found in eastern Europe, in the north and south of Africa, in India, in the United States. The history of the actual savage resembles it in many degrees.

The second period of the paleolithic age was that of the caverns. The climate became modified, dry and cold. The animals who could not live without heat disappeared. But, on the other hand, we find an abundance of those who remain have retired heretofore towards the colder regions. These are the blue fox, the arctic hare, the reindeer, and on our elevated plateaus the mountain goat, the chamois, and also the siaga or antelope. The plants are recognized as the species which to-day live within the polar circle. The glaciers before and at sundry times have descended or did descend to the plains, and covering to a large extent the valley, now extended amongst the mountains of their actual neighborhood.

It was during this epoch that Europe became separated from the American continent on the one side and with the British islands on the other. The industry is slowly transformed, and it was at first very like that of the period which had just passed. Then new forms appear. The stones, which until then were chipped on both their faces, were replaced by the flakes detached from the nuclei. One face of these flakes remains smooth and untouched, while the other face was retouched with care, and thus the implement is brought to an edge and point. These points could have served for spearheads or something similar. Other productions were rather tools, and they are called scrapers or *racloirs*, such as resemble the instruments of the same kind utilized by savages of the present day, like those of the Eskimo.

Later still the working of this stone took a marvelous development. The tools are easily distinguished from the weapons. These latter are the spears, lances, or arrowheads made of the flake or blades of flint, often large and long, retouched and chiseled with great care on both their faces. The tools, in general of small dimensions, were already of great variety. The flakes detached from the nuclei and then retouched became saws, gravers, piercers or perforators, *grattoirs* or scrapers, and the bones of all the animals were utilized in the same way for the same purpose. In the habitation or resting place of the prehistoric people of this epoch thousands of these pieces of flint and of these worked bones are found. The bones, which serve to make the ornaments, pendants, harpoons, arrowheads, needles, and a mass of objects which we can not always recognize the purpose even with all the aids of all peoples who are now in the same level of civilization.

The shells came from the ocean or the Mediterranean. The rock and the silex or flint were brought from distant beds, testimony of their commercial relations of long voyages whether in pursuit or avoidance of savage tribes or in search of better territories for game. Our ancestors frequented and inhabited the caverns or the rock shelters on the borders of rivers which furnished abundance of fish. They do not appear to have known any domestic animals in this epoch. The reindeer and the

horse were wild. The ox tribe was represented by the auroch or bison of Europe, and the urns. The domestic dog did not then exist.

No traces of cereals have ever been met with, nor any grinding or pounding instruments, like a mortar or grinding stone, which justifies the belief that agriculture was in progress. Nor was pottery yet in use. This civilization to which they have given the name of the age of the reindeer was the artistic one par excellence of all prehistoric ages. There was an efflorescence of art without precedent. For the first time man drew, engraved, and sculptured living things with which he was surrounded, and brought them out with an æsthetic taste truly astonishing. The hunters of the reindeer had some regard for their dead. They did not yet construct a cemetery, nor did they yet inter the bodies. But they often placed their dead in the grotto and cavern which they occupied, in the ashes of their hearthstone, in the middle of all the débris of their kitchens or industries, nor did they quit their habitations in this grotto for this reason. The dead, in some cases at least, were the objects of particular care. After the disappearance of the flesh the skeleton was covered with red powder, and we find it many times ornamented in what would correspond to different parts of the costume, with marine shells, amulets, the teeth of animals.

The majority of the men of this period belong to the race which have been called Cro-Magnon. There was another with savage aspect, called race of Canstadt or Spy, the name of the localities where the industries have been the best characterized. The stations in France in which these industries have been found number more than one hundred, and there are many others in neighboring countries which show the same civilization and have evidently belonged to the same epoch. There is as yet no natural phenomena which has been taken for a chronometer, or which has been able to furnish dates by which we can determine the antiquity of these two ages of stone.

M. Georges Perrat, member of the Institute of Paris, says that humanity has not even the faintest idea of these two ages. All our studies have not even pierced the darkness. We are lost in the night of our ignorance, and all our studies have not taken us over the threshold of that night.

I will not extend this further. I trust enough has been said to demonstrate the extent and importance of the anthropologic display at this exposition, and to show the importance with which the science is regarded by the savants of France and its adjoining countries. Professor Mason was quite right when he said, as he did in his paper read before the Anthropological Society of Washington, and published in the "Anthropologist," that the opportunities to study the natural history of man in Paris during the exposition were unparalleled, and that at any time the French capital affords rare advantages to the anthropologist.

POLISHED STONE AND BRONZE.

Collections of

MM. Emile Tate, Aisne.

Capitan.

Leon Cahingt, Seine Inferior.

Judge Piette.

Clemment Rubbens.

Valentine Smith.

Cartailhac.

Pitre de Lisle, Brittany.

Chauvet, Charente.

Dr. Berchon, Madoc.

Dr. Lecocq, Normandy.
Massenat, Lot and Correze.
Lemire.
Eugene Piketty.
Earnest Chantre, Koban, Caucasus.
B. Tornier, Hautes Alpes.
Can-Durban, Saint-Girons.
Collin, Seine-et Oise.

A magnificent collection was that of Mr. Frederic Moreau, filling nineteen cases and comprising every archæological epoch and period of France. They are principally his own discoveries, and he has published each year for many years a report of his work and a description of the objects found, the latter in the form of an album with beautiful chromo-lithographic illustrations.

FRANCE—NEOLITHIC PERIOD.

To the cold and dryness of the climate of the epoch of the reindeer succeeded the climate of the present time, though at first more humid than to-day. There was no more rhinoceros, nor elephant, nor the great cave bear, which are now extinct species, nor the reindeer, nor the animals which had been cold-blooded, for they had all emigrated toward the north. The wild animals at the commencement of the neolithic period seem to have been those of the present time, though more numerous than now. Animals became domesticated; the dog was the first, and probably after him the horse. The cultivated plants showed themselves at the same time, though probably in succession and not always the same variety that we now possess. Flax was utilized, but not hemp. The industry indicates to us with what slowness civilization has evolved. Man lived not in the cavern, but only just outside.

The civilization of the neolithic period is characterized principally by the polished stone hatchet. This implement has become so abundant that many communities have counted them by the thousand. Ethnography has taught us that the use of these implements was much varied. Sometimes it was an arm, sometimes a sign of the chief, sometimes a cutting tool, and sometimes an instrument to dig in the earth. We have discovered the different systems of the handling of these hatchets and their different destinations. They were made of the local rock and the form varied slightly according to their region. The same observation is true of all contemporaneous objects. This difference in these tools and in the objects of their industry would tend to show that there were distinct groups in the population of France at this epoch. It is doubtless true that there are found a number of variations in arms, tools, ornaments, and implements, which on examination as to material, etc., prove to be foreign to the country, and are therefore believed to furnish proof of foreign commercial relations. There were quarries and workshops of flint which seem to have been made for exportation, notably that of Grand Pressigny in the Vienne, Meu-

don, on the Marne, near Paris, also in Aveyron. In all these they had mines of flint, with wells and long and deep galleries for exploring them. Bone, stone, and wood were worked with talent and for various destinations. The pottery became in extensive use.

The Swiss lakes have preserved pieces of textile fabrics from which they can be easily reproduced. This civilization compares with that of the natives of the Polynesian Islands.

The man of that period had the idea to build his habitation above the water, and each lake has preserved at its center and in its bottom the ruins and cumulation of débris which has furnished the most complete information.

The lake dwellings constructed on piles firmly driven into the bottom, were agglomerations of huts or cabins which did not differ very much from those which later were the habitations of the Gaulois. The coast was well inhabited. Each shore bears an enormous accumulation of shells, principally of oysters, in the midst of which we now find well-preserved worked objects, sometimes of flint, sometimes of horn, bone or shell. These shell-heaps are probably the earliest human habitation of the neolithic period.

There has never been found a picture or engraving of a human figure in this stage, except a possibly human representation sculptured in relief on the sides of one of the grottoes in the Marne, and something of the same kind on several dolmens in Normandy and Provence. The neolithic human races were much varied and mixed. No one has been able to determine any relation between any one of them and the monuments which belonged to the same age.

The names given by M. Cartailhac to the periods in the prehistoric history of France subsequent to the neolithic and before the historic period, were the Celtic and Gauloise periods. They correspond with the ages of bronze and iron.

DESCRIPTION OF SPECIAL EXHIBITS.

Probably the most interesting and instructive collection displayed under the head of prehistoric anthropology and archæology, certainly that which attracted the most attention, was the reconstruction of the families of men of the different prehistoric races. The figures were life-size and reproduced after the most accurate study. The greatest care was used in the details of the anatomy, the industry, the costume, and surroundings. They were the combined work of scientists and artists the most capable, and all that the anthropologist, ethnologist, anatomist, and artist sculptor could do was done to make them true and correct representations. One group represented the chelléen epoch or the age of the mammoth, or alluvium, and this was called the first industry. The second represented the cavern period, or the age of the reindeer, and was called the first artist. The third represented the neolithic period, or the age of polished stone. It was the first con-

structor. The fourth was a bronze foundry and represented the first metallurgist. Each one of these occupied its respective corner in the interior court of prehistoric anthropology.

In the center was a group representing the tent and encampment of the Samoiedes from northern Russia with their outfit of reindeer, etc. This was intended to represent the age of the reindeer of modern times.

Two other groups occupied places in the same court. One represented the age of iron of primitive times and was taken from a group of Soudan blacksmiths; the other was a group of Aztecs making paper of agave plant. The latter was made from models furnished to the Trocadero Museum by the Smithsonian Institution.

These were the work of M. Jules Hebert, the artist modeler of the Trocadero Museum, done under the direction of Dr. Hamy, conservateur of that museum. The principal groups will be described.

GROUP 1.—PALEOLITHIC PERIOD, CHELLÉEN EPOCH.

(Corresponding to the alluvium or age of mammoth.)

At the foot of a tree which bent over and spread its branches to furnish a protection were a man and a woman engaged in making the rude flint implements of the epoch. (Pl. CLVII.)

The proportions and general forms of the body the cephalic indices and the general morphology of the face are taken from the human crania and bones found in the caverns which have served as habitations for the man of this epoch—Spy, La Naulette, Gourdon—while the flesh and particularly the nose, lips, breasts, etc., are reproduced after atavistic types, specially observed in Belgium and the neighborhood of Paris. The costume is imaginary, but was patterned after that of the savages of modern times.

GROUP 2.—CAVERN PERIOD.

(Corresponding to the age of reindeer or the solutréen moustierien and madalenien epochs.)

The scene (Pl. CLVIII) represents a woman and a young man engaged in engraving the reindeer horn, as described in the chapter on prehistoric art. The father of the family has just returned from the chase and carries the hind quarters of a mountain goat, which he has killed.

The natural portions of the scene are reproductions of the rock shelter at Laugerie Basse as determined by the discoveries of M. Elie Massenet. The three personages were reconstructed with the aid of the skeletons which had been found almost entire in the caverns of this neighborhood, Laugerie Basse, Cro-Magnon, etc. By their means the anthropologist was able to fix the proportions of the body and the essential forms of the face and skull. The soft parts representing flesh, were made after individuals of an apparently similar race, principally the Berbers, of the type of Cro-Magnon. The arms, tools, and implements, were patterned after original pieces obtained from the caverns of the neighborhood. The disposition of the hair of the old man, is that of the celebrated engraving on reindeer horn found at Laugerie Basse by M. Massenet and known under the name of "the man chasing the auroch." The shells which have been pierced and strung, and worn as ornaments



REPRESENTATION OF THE NEANDERTHAL OR CANSTADT RACE OF MEN.

(The Chellean epoch of the Paleolithic age.)



REPRESENTATION OF THE CRO-MAGNON RACE OF MEN.
(Cavern period of the Paleolithic age.)

around the head and on the arms and limbs, are placed as they were found by M. Cartailhac on the fossil man at Laugerie. The shells and amulets of ivory worn by the woman and the young man are reproductions of those of Cro-Magnon. Thus much is known or, at least, can be fairly judged to be an actual representation of these people. The costumes of skin worn by these people are purely imaginary, for nothing is known concerning them. Therefore, it has been made up from the costumes of various savage tribes. The bones of animals, etc., which lie in such a mass on the ground around the mouth of the cavern are believed to be a substantial representation of the ancient times, and give one an idea of how these things accumulated.

GROUP 3.—NEOLITHIC PERIOD OR AGE OF POLISHED STONE OR ROBENHAUSEN EPOCH.

The scene depicted in Plate CLIX represents three men erecting a prehistoric funeral monument. One is making a hieroglyph, the second polishing a hatchet by rubbing it on one of the great polishing stones, and the third is making a pottery vase. This epoch or period is quite a different civilization from either of the former. It was characterized by the polishing of stone for weapons, tools and implements, by the development of the ceramic industry, by the invention of architecture, and by sculpture on the face of the rock. This scene is intended to represent the principal of these discoveries. It does not, and, indeed, could not represent the other manifestations of civilization, such as agriculture, sociology, etc. These men are erecting a dolmen. It is not of any particular one, but represents the principal parts of several. The stone with a hole through it, which separates the vestibule from the funeral chambers, is copied from that of la Belle-Haie, near Gisor. The first stone to the left exhibits a feminine figure, or one which has been so considered, though I have had doubts about it. Yet these and similar have been found, one each in Normandy, Marne, and Le Gard. The polishing stone of the second workman is copied from the collection of Dr. Capitan. The vase of the third is made by hand, and one of the common dolmen type.

The remarks heretofore made as to the faithful representation of these personages taken so far as possible from originals, applies here. The potter is a type of one of the races of Furfooz, Belgium, discovered by M. Dupont, and is the oldest potter known. The costumes are reconstituted from similar objects found in the lake dwellings of Robenhausen. This settlement is believed to have been destroyed by fire, and the objects have been charred, and, falling into the lake, the fire was extinguished and they thus preserved. The pieces have been found in such numbers, and extend to such variety, as that the anthropologists feel justified in believing that they have a substantially correct representation. Much of the material is the hammered or bruised bark. Other portions of the costume were of linen cloth, dyed sometimes brown with ochre, sometimes blue with pastel. The foot coverings are in-

spired by those of an Archaic Gallo-Roman god, *he of the Hammer*, which is believed to have had a high antiquity in that country.

THE BRONZE AGE.

The scene in Pl. CLX represents a primitive foundry. Under a great rock, protected from the wind by a hedge of dead brush and twigs, a molder and his assistant are engaged in casting implements of bronze. These two personages represent the introduction of bronze which is believed to have come from the Occident. The assistant is of the type of what is called the *Nutons* in Belgium and comes from the *Trou* of that name, being one of the caverns of the Lesse, near the town of Furfooz. This cavern contains a great number of skeletons of men belonging to two distinct types. The Nutons are dwarfs, and this is intended to represent the smaller and inferior of the two races. The master molder is of the type of the most ancient Ligurians who occupied the territory on the shores of the Mediterranean in what was ancient Liguria, say from Toulon to Genoa. The two figures are dressed in a loose costume of leather. The master founder pours the metal from a crucible, held by means of a large pair of tongs made of bronze, which is a reproduction of such an implement discovered in one of these foundries and now at the Musée of St. Germain. The metal is represented as boiling in the mold. The crucible and mold are copied after originals in St. Germain. By the side of the workmen are pieces of bronze, broken ready to be melted, while on the other side a dozen or more new hatchets are laid out apparently ready for sale.

The amount of work bestowed upon this, as well as the other group, in order to make them faithful representations of originals, must have been great, and their success is a high testimony to the gentlemen who conceived and executed it.

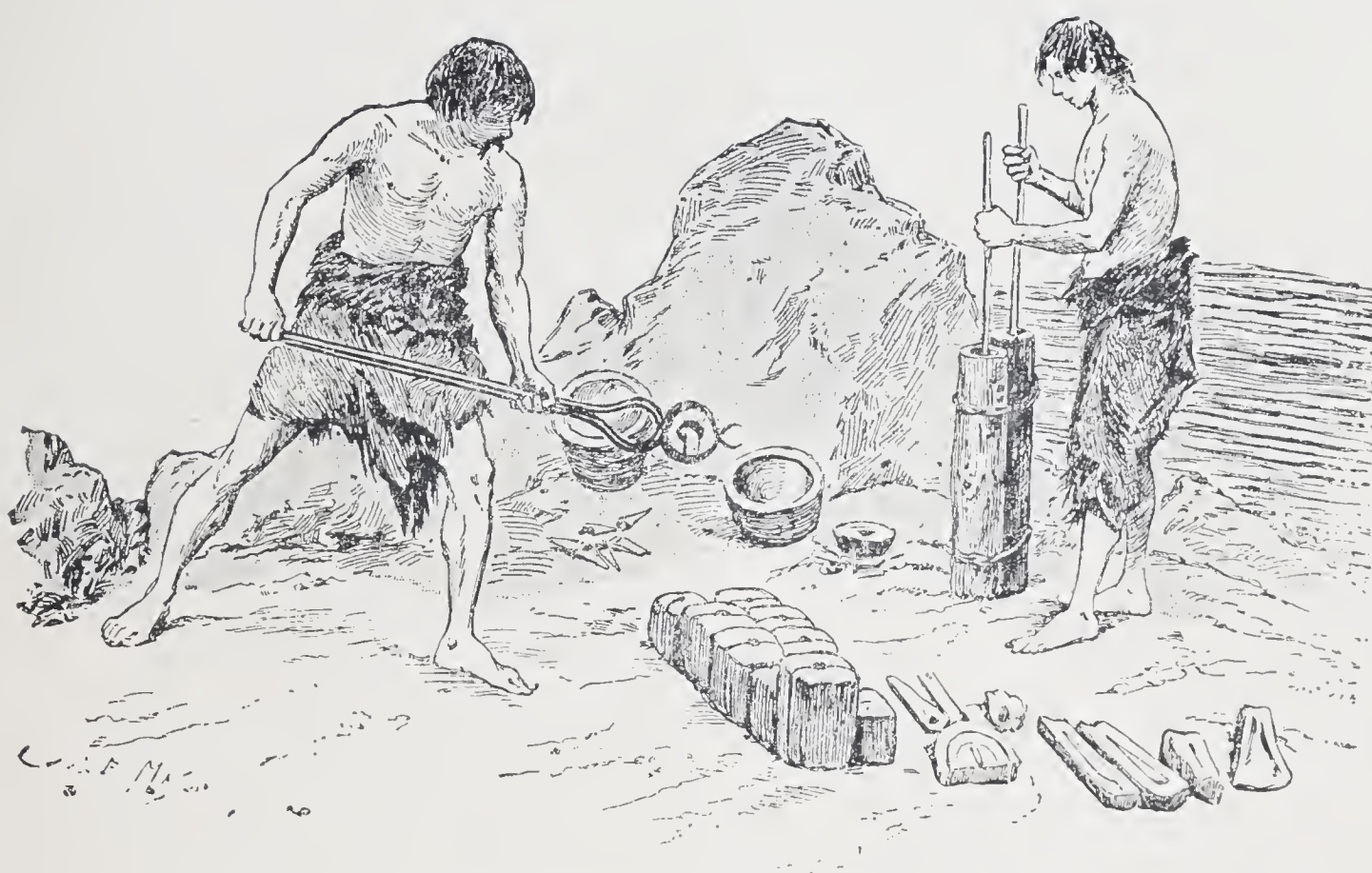
I may be pardoned for a few words explanatory of the extent of this industry and the age or civilization to which it belonged, by which I tell that there have been discovered in France alone fifty-seven such foundries, that the implements of bronze, broken and made ready for melting, number among the thousands, the implements found among the ten thousands, and the new objects deposited in *caches*, evidently never used and ready for sale, have been found in many places. The great foundry at Bologna had 14,000 pieces of broken implements for a like purpose, and weighing several thousand pounds.

THE IRON AGE.

Two men, life-size, were at work with the forge, beating and hammering, working the iron. One, the assistant, helper he is called in the trade, blew the bellows, the other was the master-workman. The bellows consisted of two skin bags with a bit of iron pipe or tube tied in the mouth of each laid flat upon the ground, the two nozzles coming together. The alternate motion of these two bags like the working of an accordeon kept a continuous stream of air flowing from the (one or the other) nozzles which fed the fire on the ground and so heated the



REPRESENTATION OF A GROUP OF PREHISTORIC MEN.
(Neolithic, or polished stone age.)



REPRESENTATION OF A GROUP OF PREHISTORIC MEN.
(Age of bronze.)

iron. The anvil was about 2 inches long and 1 inch wide, driven into a block of wood which in its turn was driven firmly in the ground, the whole affair being not more than 5 or 6 inches above the level of the ground. This was the most primitive blacksmith shop I had ever seen, and it interested me much, but my interest was redoubled when on going through the Esplanade des Invalides in the colony of Senegal I came upon the same machine, same workshop, with the same furniture and tools and implements, and all worked in the same way.

Another of these life-size groups constructed and displayed in the court of the section of anthropology was from our own continent. It represented the Aztecs in old Mexico in the act of preparing the agave plant and making it into fiber to be woven into cloth (Plate CLXI). The agave plant is the American aloe, and there were many of them planted around and in the neighborhood of the Mexican colony. It serves many purposes of livelihood for the poor people, probably not now so much as in times of antiquity. It made their fences or hedges, the trunks of its trees made their houses, its leaves served for ropes, it made thread of the long fiber, and needles of the sharp points. The interior of leaves, the juicy part, produces alcoholic liquor, and it can be formed into the fiber of which their textile fabrics were made. The two life-size figures, the one engaged in beating, the other in rolling or bruising the agave plant fiber, were believed to be correct representations of the Aztec people at the time of the discovery of America by Columbus.

SOCIETY OF ANTHROPOLOGY OF PARIS.

This society made a separate display under the protection of the minister of public instruction.

The objects displayed under the direction of the Society of Anthropology occupied a large space in the grand hall in the second story of the main building in the department of the minister of public instruction. Its classification was as follows :

I.—ANATOMIC ANTHROPOLOGY.

(1) Society of Autopsy, (2) Cerebral Morphology, (3) Histology of Cerebral Convolutions, (4) Craniology, (5) Osteology, (6) Comparative Splanchnology, (7) Myology, (8) Anthropogeny.

II.—PREHISTORIC ANTHROPOLOGY.

(1) Geologic Palethnology, (2) Mineralogic Palethnology, (3) Ages of Stone. Classification, (4) Processes of fabrication of the various forms of implements, (5) Age of Metal, (6) Paleoanthropology—prehistoric skulls and skeletons, (7) Trepanation, (8) Agriculture of Palethnology, (9) Methods of Excavation.

III.—ETHNOGRAPHY.

(1) Algeria and Tunis, (2) Central Asia, (3) Malacca, (4) Indo-China and Cambodia, (5) Cochin China, (6) United States of America, (7) Venezuela, (8) Miscellaneous.

IV.—HISTORY OF RELIGIONS.

(1) Amulets, (2) Divinities.

V.—DEMOGRAPHY.

(1) Anthropometry, (2) Medical Geography.

VI.—BIBLIOGRAPHY.

(1) Books, (2) Maps, (3) Charts, etc.

The first section of the first division was autopsy, and with it cerebral morphology. Here were displayed the brains of the following gentlemen who had belonged to the society of autopsy, and as such their brains had been dissected in the laboratory. The peculiarities and anatomic description were attached to each one:

Jules Assezat, died 1876, aged 45 years.

Louis Asseline, died 1878, aged 49 years.

Dr. Coudereau, died 1882, aged 50 years.

M. Gambetta, died 1882, aged 43 years.

Dr. Adolph Bertillon, died 1883, aged 62 years.

Gillet-Vital, died at 63 years of age.

Charts were shown in which some of these brains were superposed, notably that of Dr. Bertillon and Leon Gambetta, so that one could compare them.

In the section of cerebral morphology was displayed a chart of the brain of decapitated assassins, of imbeciles, and anthropoid apes. Another was the encephalic profile of four specimens, two gorillas, an adult and one of 2 or 3 years; two humans, an adult and an infant of 2 years. These various designs were made by the stereograph, and were so superposed that one could see the differences between them. Each one was represented, and yet one could see plainly the difference between them.

In craniology not only full tables and charts were shown, but there were practical illustrations, by means of natural specimens, of the differences in the cephalic index in the human race, and also the differences in the different races. This made an exceedingly interesting and valuable display. There were numerous tables and charts, full of information as to the cranial form, capacity, deformity, etc., of the different races of men, and of as many different kinds in the same race as was possible, and these compared again with the anthropoid apes. Along with them were displayed the anthropometric instruments by which the measurements were to be made.

In osteology were tables and charts at great length, in great detail, with many figures, giving full and complete information in relation to various portions of the human skeleton: sometimes in relation to itself and to other members of the same family; at other times compared with those of the higher quadrupeds.

For example, one showed the relative development of the different portions of the body according to sex, race, age, and height: the relation between the long bones and the height of man, the method of measuring the long bones and thus determining the relation between



REPRESENTATION OF AZTECS WORKING THE AGAVE PLANT.

them and the height:—showing the relation between man and the anthropoid apes in relation to flattening of the tibia, the development of the different organs and functions in the two sexes. The remarkable thing about this chart was that it demonstrated that the weight of the brain is relatively greater in women than in men.

Splanchnology was represented by the internal organs of man and gorilla compared.

Anthropogeny was illustrated by six charts taken from the atlas of Monsieur Mathias Duval, representing his theory of the commencement of life in man. These charts represented the ovum of many animals, including man, in their various stages of impregnation, so that the differences could be easily compared and studied. He opposes fiercely the doctrine of heredity laid down by Weisman, Turner, and their school.

Prehistoric anthropology had an extensive display made in great detail, yet with the number of specimens reduced so as to employ as small a space as possible. The classification was that of Monsieur D'Ault du Mesnil, which was a variation of the classification of de Mortillet. It began with the quaternary inferior corresponding to the Chellèen of M. de Mortillet, the contemporaneous animals being the *Elephas antiquus*, *Rhinoceros merkkii*, *Hippopotamus amphibius*, and so went through the various stages or epochs until it ended in the reindeer—this for the paleolithic period. Samples and specimens were shown of the fauna, and of the human industry in each. To describe it satisfactorily would be to write an entire book upon the science. It was continued through the various epochs and periods of the age of stone down to and including that of the Neolithic or polished stone. The mineralogy of prehistoric anthropology also received attention, and specimens of the various kinds of stone or minerals employed were displayed. Processes of the fabrication and the working of minerals of stone were also shown.

A small series of the implements characteristic of the age of bronze were also exhibited.

Prehistoric craniology received due attention and was represented by the casts of the skulls of the various races which were divided, first, into the great periods of paleolithic and neolithic, and these again divided and subdivided according to the best information.

Trepanation was not forgotten. Several specimens were shown, together with the means by which it might have been practiced.

Prehistoric agriculture had a fine representation in its display of cultivated fruits, cereals, and vegetables with the textile plant.

Not the least interesting of the entire prehistoric display in the exposition was that showing the proper methods for making excavations. This was even more important because of its result. By means of these investigations were determined the superposition of one civilization upon another in the various caverns which had been occupied for a long time as human habitations. Thus was determined the succession of

occupations, consequently the succession of industries, of civilizations, and so of races. These were shown in detail and with satisfaction. I had visited many of the places here described and was acquainted with several localities, and it was to me an intensely interesting exhibit. It showed the successive ages of prehistoric civilization in a most satisfactory and convincing manner.

The department of ethnography was fairly well represented, but I only mention two; one the exposition made by M. Boban from North America, those which had been given to him by the Smithsonian Institution, and which I recognized as having been selected by myself. The second was the display from the Koekenmmoddens of Cambodia, and now interesting because the National Museum has just purchased a similar series from that country which were there displayed.

The history of religion figures largely in the science of anthropology. It was well represented in the exhibition of the school of anthropology. It will serve for a separate paper.

Anthropometry was illustrated by several charts, showing the various measurements, especially of France, but also of other and adjoining countries.

Medical geography illustrated by charts the various condition of France from different points of view.

Bibliography.—There was a library of the principal works published in France of late years bearing upon the subject of anthropology and prehistoric archæology.

DENMARK.

In the little corner room from the pavilion, just beyond it on the right, entering from the Buddha, was installed the anthropologic display of Denmark. The government called to its aid three scientists, who are at the head of important departments of the Royal Museum of Antiquities in the Prince's palace at Copenhagen. Dr. Sophus Müller was charged with that portion of the exposition relating to prehistoric archæology; Mr. Kristian Bahnson with the second part, relating to the ethnography of Greenland; and Mr. Soren Hansen with the third, anthropology in general. All these sections were wonderfully prepared and united admirably in forming a comprehensive display of the great science.

Denmark was the seat of the discovery of the existence of prehistoric man. In 1807 the first public museum was organized for the reception and display of prehistoric antiquities, at Copenhagen; and here, and then, was announced for the first time that chronologic division of the prehistoric times into the ages of stone, bronze, and iron. This was the work of Mr. Thomsen. He commenced his work in that country in 1816 as founder of the great prehistoric museum of northern antiquities. He held the position of curator and did the work belonging thereto for 50 years, and this great museum, with its

extensive and wonderful riches, the result of his life's work, is his monument.

The coadjutor of Thomsen was Worsaae, who during his life's work of 25 years did more probably than any other one man, a scientist and not particularly a discoverer, to establish the science of prehistoric anthropology on a firm basis.

Engelhardt, Steenstrup, and Thomsen were the early ones. To them must be given the honor of being the discoverers of prehistoric man. But Worsaae used these discoveries with the rarest genius and talent. It was not simply in prehistoric anthropology his talent was shown, for he was an all round man, who did admirable work in other branches of the great science, and not content with that, was called in his later years to be a councillor in the cabinet of the king, and there showed that rare combination, an illustrious scientist and a profound and sensible statesman.

The names of others can not be given in this paper. It will be enough if we can but mention their work. A systematic exploration, survey, and map have been commenced of the prehistoric monuments of Denmark. The archæologists are charged with this, and they, accompanied by good artists, are traveling and working over the country in order to make this map with all accuracy in both art and science. One-third of the entire country has been thus surveyed and more than one-third of this great work has been completed. All the monuments have been discovered, designated, drawn, and the most of them are in the hands of the engravers. One thousand five hundred of these monuments are now placed under the protection of the law, either as property of the government or under prohibition to destroy them without giving the government the first right of purchase. Four great leaves of this archæologic map of Denmark were displayed upon the walls, and I confess the feeling of envy of them and the regret that my own country has not such a map. I was only consoled by the hope that the Bureau of Ethnology would soon have completed the linguistic map which is in progress under its direction.

These four Danish charts of the archæological monuments represented the Islands of Möen, a part of the Seeland, the east of Jutland, and a part of its interior.

A library containing all or nearly all the Danish books upon the subject of prehistoric anthropology was displayed in the cases in this department, and the organizers thereof were very free in their commendations of the private collectors and individuals who had so willingly given of their riches to secure success at the exposition.

Dr. Sophus Müller thus expresses his appreciation of the patriotic feeling of the Danish people in making contribution to the need of the governmental display at the French Exposition :

The Danish archæological display gives a good idea of the patriotic principles of our country, as it is composed for the greatest part of contributions from private col-

lections. They have felt it a duty that our country should be dignifiedly represented at Paris; where is reunited this year the International Congress of Archæology and Anthropology, and they were pleased to offer to the committee their best and most precious objects. The number of objects offered were even so great that it would itself form a small museum. But the space which had been reserved for us by the committee of the Exposition was too limited and it would have been an impossibility that all could be accepted. For this cause the objects exposed were much too many; but on the other side, what we lost in quantity we made up in quality. It shows that our country possesses the best and the most interesting objects belonging to prehistoric archæology.

The age of stone in Denmark, indeed in Scandinavia, is divided by the scientists of those countries into two parts. The earliest was that of the Kjoekkenmoeddings, where the implements were rough and rude, small, and comparatively insignificant. But it was the age of polished stone. The second epoch of the age of stone comprised those magnificent and beautiful examples of flint chipping found in that country. The paleolithic age is not represented in Scandinavia. No objects belonging to that period have been found there, and it is believed by all that it was uninhabited during that period. But in the implements of the neolithic period that country was especially rich. There were the polished hatchets, the large tranchets of flint, again the small ones, the scrapers, the perforators, and the hatchets of deer horn. These have all been found in, and are supposed to belong to, the Kjoekkenmoeddings, and represent the first stage of polished stone in that country. I can scarcely attempt to describe the beauty and grandeur of the display of the second period of the age of stone. One must have seen the magnificent specimens of that country in order to appreciate or even understand what is meant by their grand display. I can only name at hazard, without attempting to describe the display. There were nucleii and the hammer stones, the long blades and flakes of flint, the exceedingly large and long stone hatchets shown in all the stages of their manufacture, from the first flake struck from the rock to the finely polished and finished hatchet of extraordinary length. The finely chipped poignards, with the ridges in their handles worked herring-bone fashion, blades long, thin, sharp; spear and lance heads of the same style, the flint flaked almost like shavings, from the edge to the center, and done with a regularity which would seem impossible but for the specimens now before our eyes. Arrowheads in profusion and of every possible form, shape, and style of manufacture. Each one of these particular forms, where there was anything peculiar about it, was represented by three examples, one of which was chipped ready for polishing; another, polished, which was new and had never served, and a third, a specimen which was more or less used. There were other series arranged in the same manner; scrapers, knives, chisels, club-heads, all the sort of implements and weapons belonging to that same age; scrapers, and pottery of various forms and ornamentation.

The polished-stone age in Denmark is most instructive and interesting. The number of implements of this period have filled the public and private collections and are a source of pride to all. The variety and elegance of form, the perfection and surprising management of the fashioning, provoke the greatest admiration. The principal reason for the excellence in Denmark lies in the superior quality of the flint of that country, and the ease with which it could be worked. If we consider the geographic formation of the country and the little islands which are surrounded by the numerous fiords that have favored such things, we may understand the circumstances which gave birth to and favored the development of a civilization which was comparatively well advanced. This age is supposed to have endured for about 2,500 years and to have come to an end from 1,500 to 2,000 years B. C., when it was supplanted by the age of bronze. This age was correspondingly well represented. It is but small wonder that Denmark should have furnished those profound students who have made such wonderful progress in the science of prehistoric anthropology. Its richness in antiquities is surprising and can not be understood without being seen, and the more it is seen and studied the more surprising and bewildering it becomes in number, extent, and beauty. Not to mention more than the word amber, would be to give a theme which, to be exhaustive, would require an entire book. The museum at Copenhagen possesses now over 200 discoveries of amber wrought by the prehistoric man as his ornaments for personal decoration. Four-fifths of these came from the Island of Jutland, but the rest were fairly well distributed around the various coasts. To follow out the commercial relations between the Scandinavian and other prehistoric countries by means of its trade in amber would require more space than could be devoted in this paper. Wherever in Europe prehistoric man of this epoch has been found, amber has been found with him, and it is believed that nearly all of it came from the North Sea and was exchanged for the objects, implements, and weapons of a foreign country. It is believed that the commerce in amber can be traced back to a period commencing 1,000 years before Christ. Numerous cases of amber were displayed in this Exposition.

Of the bronze age there were many specimens. The bars or ingots of bronze, rough and rude, the molds for casting hatchets and saws, hatchets of all kinds, knives, saws, sickles, razors, pinchers, arrowheads, swords, poignards, trumpets, spearheads, rings, fibula, etc., were there shown in all perfection; in all their beauty and wealth of form and compass. One case was devoted to vases, of gold, of bronze, of wood; some of them are ornamented with tin inlaid, having the appearance of the ware of the Japanese. The metal work was some of it hammered, some repoussé, some cast. The ornamentation was of the style of the bronze age, geometric design, made by points and lines.

Two exceedingly interesting specimens in the Danish display, that impressed themselves with greater ease upon the understanding and

memory of those who saw them and gave them, at less expenditure of thought, a better understanding of the prehistoric man of that country during the bronze age, were the two figures, reproductions of a warrior and a woman, dressed in the costume of the period, being a reproduction of like objects possessed by the museum at Copenhagen. The warrior wore a bonnet upon his head; it was round, and made of double cloth; no seams were shown. His body was covered with a square piece of cloth coming down to the knees and bound around by different straps and thongs, tied at the back. He wore a mantle upon his shoulders which fastened at the neck with a fibula of bronze. His feet were covered with sandals bound across the top with cord; he had a leather belt, which was fastened with a button of bronze ornamented with a piece of incrustated amber. On his arm was a gold ring, and he held in his hand a sword of bronze.

The woman wore upon her head a net, which was in a sufficient state of preservation when found to enable them to imitate the fabrication. It was made by simple interlacing of threads. Her jacket was a single piece of stuff which was originally too short and had been added to—pieced as it were. Her petticoat was made without being cut and was sewed only to bring the two ends together. Her cloak, which fastened with a hook, was ornamented in different colors, different designs being used in an ingenious manner of twisting the thread. All the jewelry which she had—the collar, the clasp to her cloak, the bronze bracelet, and the gold ring were reproduced in the forms which have been found to be the most frequent. She carried by her side a small poniard in a wooden scabbard.

In the reproduction of these objects the musée had employed the veritable bronze; one part tin and nine parts copper. These dresses were made by Madame Klein, director of the Academy of Art and Industries for Women, who has studied them minutely in their original production, and she and her scholars have produced them with minute exactness. The color was the only thing about which there was doubt, for, be it understood, that all these objects were found in, and came from, tombs, and from having lain either in wooden coffins, or by contact with the earth, have become a dark brown or possibly a black. I have one of these pieces from the same place out of one of these tombs. The nearest description I can give of its color would be a butternut.

The age of iron was represented, a full series of the ethnography of Greenland, together with all the books and specimens presented or gathered by that celebrated and well-known ardent scientist and anthropologist, Mr. Soren Hansen. One of the most important works done by anthropologists in later years in relation to America has been that accomplished by this gentleman, and he had at this display an example of his work. Many years ago Lund, who was himself an aid, being in the plains and caverns of Samidouro, Brazil, made some anthropologic discoveries in regard to the prehistoric man, and being

unable to make studies of them himself, or, may be, having completed them, sent them to Copenhagen. They were lost in transit and did not arrive for some time after. Upon their arrival they were unrecognized, and it was not until the last 3 or 4 years that these valuable relics were discovered by Mr. Hansen, brought to light, investigated, compared, measured, and the result made known to the world. He thinks from these investigations that there is evidence at least of the possibility of man having existed in South America in the Tertiary period, and in this, I believe M. de Quatrefages, the most conservative of all European anthropologists, coincides, except as to the geology or paleontology—whether the Tertiary epoch of America is not one period behind that of Europe. This question has, I believe, received little attention from the American paleontologists, except Professor Cope, and he doubts the correctness of the conclusion. If he be correct, it puts the appearance of man in South America at the greatest antiquity probably of any other well-defined discovery of the kind.

The age of bronze came to an end in Scandinavia about the commencement of the Christian era, but the age of iron or its first use began some centuries before that. These ages necessarily lap one over the other. The prehistoric iron age in Scandinavia was divided into three grand epochs before the commencement of the historic period which was about the year 1000. These were the epochs of the barbarian.

At the far end of the pavillion was exhibited a great runic stone, which, as shown by its inscriptions in ancient runes, recounts the exploits of Harald Vlaatan, who lived from 935 to 986 A. D., and to his illustrious parent, Gorm, the first historic king of Denmark and to his queen, Thyra.

Neither time nor space permits a description of the other two departments of the Danish display—the ethnography of Greenland and Mr. Hansen's display of anthropology.

Mr. Waldemar Schmidt had the immediate charge of this exposition, and he, as many others, attended on each specified occasion to open cases, display objects, explain them, and make the necessary speeches and lectures for the education and edification of the public. These gentlemen have recognized the great advantage to be derived from anthropometry in their anthropologic studies both of prehistoric and modern Greenland. Therefore they have organized their governmental commissions for the purpose of carrying on these studies. More than three thousand Greenlanders have been measured, weighed, and tested with the exactness peculiar to the science of anthropometry. The walls were covered with charts of anthropometric measurements, showing in great detail the difference of height, average, and extremes, the color of the hair and eyes, and the effect in these respects of the crossing of the races of the Danes and Greenlanders and Eskimos.

SPAIN.

Spanish prehistoric archæology was represented in four cases, being selections from the collection of MM. Henry and Louis Siret, No. 11 rue Joseph, Antwerp, Belgium. These gentlemen (brothers) made extensive exploration in the province of Carthagená, in the southeast of Spain, which they published in a magnificent album. I had the pleasure to visit their house and examine their collection at Antwerp. Their collection represented the neolithic period, the bronze age, and the period of transition from one to the other. There were arms, implements, and ornaments in stone and bone, immense vases of pottery, some of which were used for burial by inhumation. The usual bronze implements and objects were shown. There were sepultures of various kinds, and fragments of clothing made of linen cloth were found with the bodies. Agriculture and industries had large representation.

SWITZERLAND.

Switzerland was represented by the collection of Mr. Valentine Schmidt. There were the usual objects belonging to the neolithic period and found in connection with the lake dwellings of that epoch. While the objects were choice and well selected, and consequently of beauty and importance, there was nothing remarkable about them more than one can find in good museums.

BELGIUM.

Belgium had a representation of fifty cases devoted to prehistoric anthropology and archæology, though the occupation represented may have come down somewhat into the commencement of historic times. That portion of their display which they called ethnology was devoted almost exclusively to the crania and skeletons of prehistoric men, but which they carried over to ethnology because of the exhibition of the specimens of Neanderthal, Engis, Spy, Cro-Magnon, Furfooz, Sclai-neaux, Antwerp, Selzæte, with some individuals from Frankish cemeteries.

The paleolithic period was well represented, and this in some of its earliest manifestations, for the occupation of Belgium by prehistoric man seems to have begun at as early a period as that of any other country of Europe. A principal depot of this early occupation is at Mesvin, near Mons (Hainault). There were many pieces of flint displayed from this depot, which is believed by some of the Belgium prehistoric archæologists to belong to the very earliest quaternary geologic period, and to have been earlier than the depots at either Chelles or St. Acheul.

In objects belonging to the cavern period—mammoth and reindeer—southern Belgium is especially rich. The rivers Meuse, Lesse, and Sambre have many caverns in the ravines along their banks, and they

were largely occupied by man in this early antiquity. The representation of the geography of this country and of the caverns was exceedingly elaborate, and the display of objects therefrom very rich.

M. Dupont continued in 1872 the excavations of caverns in that country which were begun by Schmerling 35 or 40 years before, and MM. de Puydt, Fraipont and Lohest took it up in 1884 where M. Dupont had left it. These gentlemen made many investigations and excavations in the caverns of the Lesse and Meuse, but the principal one was at the Grotte de Spy, a few miles northwest from the city of Dinant, where were found the celebrated skulls and skeletons of prehistoric man. Not only did these discoveries verify those of Schmerling and Dupont, and establish with greater certainty the existence of the paleolithic period and the human occupation during that period in the numberless caverns of that locality; but it served to emphasize our knowledge concerning the race of men belonging thereto. The discoveries at Neanderthal and Canstadt were only of human skulls, but that of Spy included much of the skeleton, and has done more than probably any other to give us an accurate knowledge of the anatomy and osteology, and of the size and form of this, the man of greatest antiquity whose remains have yet been found.

The Belgian display was worthy of much commendation. Not only was it quite complete, but its arrangement was excellent. The student, as he passed along, could comprehend and understand the science which it illustrated and the sequence of the specimens displayed. Maps were displayed upon the walls which showed the various prehistoric stations and the different periods and epochs to which they belonged. With lithographs, drawings, and photographs the various caverns of southern Belgium were well illustrated. La Naulette, Pont-a-Lesse, Montaigle, Furfooz, Chaleux, Hastiere were shown in their geographic position, by a general view, three sections, longitudinal, and transverse. The cavern of Spy was shown in much the same way, but, being more modern and considered more important, it was given in greater detail. A section was given both ways, showing the various strata in the cavern, while in the case below were laid out a series of objects found in each stratum. This was continued in a similar manner in many other of the caverns. By these means one could study the prehistoric archæology of Belgium in great detail and with much certainty.

The neolithic period was occupied principally with the great quarry at Spiennes. I had visited it and studied it under the guidance of M. Cornet, now unhappily deceased, and this display was particularly gratifying to me. Many excavations have been made in this quarry, and it and the workshop have been so studied as to be understood in all its relations to the prehistoric man. These excavations had been carefully designed at the time, and the designs, together with the objects found, were here laid out before the beholder.

These labors so conscientiously done in respect of the prehistoric sta-

tions mentioned, were extended with greater or less success over almost the entire country, and what surprised me was that in northern Belgium, in the neighborhood of Ghent, and between it and Antwerp, have been lately found enough of the prehistoric objects to establish the human occupation of that country in prehistoric times.

HISTORY OF WRITING.

The study of inscriptions has demonstrated the relationship between the various forms of the alphabet, and has enabled the student to follow their transformation from their origin to modern times. An attempt was made at the French Exposition by Monsieur Philip Berger to collect the principal forms of writing in antiquity, and to give a résumé of their progress and relationship.

CLASSIFICATION.

I.—*Pictographic.*

On dolmens and stone monuments of western Europe.	Eskimo.
Scandinavia.	Oceanica.
North American Indian.	Messages : Sticks, feathers, knots, etc.

II.—*Hieroglyphic.*

Cuneiform :	Egyptian.
Sumerian-Akkadian.	Hittites.
Babylonian.	Chinese.
Assyrian.	Mayas.
Persian.	Mexican.
Scythian.	Easter Island.

III.—*Alphabetic.*

Semitic :	European :
Phœnician.	Etruscan.
Punic.	Greek Archaic.
Neopunic.	Latin Archaic.
Ancient Hebrew.	Scandinavian.
Aramean :	Runic stones, first and second period.
Nabatean.	Ogham stones, Ireland.
Palmyrean.	Gaul.
Hebrew Carrè.	Saxon
Syrian.	British.
Arabic.	Hindoo :
Himyarite.	Sanskrit.
Ethiopian.	Bactrian.

PICTOGRAPHIC WRITING.

No discovery or invention had so great an effect upon the development of human civilization as that of writing. The invention of writing was the debut of history. Writing made history possible. Although we have no knowledge of the actual beginning of writing, we may suppose it to have been by picture writing. This certainly was the earliest of which we know. It was called pictography, and gave but little more than the rudiments of the idea intended to be recorded. The pictographic inscriptions found on the most ancient monuments of the stone age have a marked resemblance to those we find to-day among savages who live in a corresponding state of civilization. It employed usually a mixture of images borrowed from animal life, and of figures which were after a fashion geometric.

Pictographic writing seems to have spread over almost the entire surface of the globe. Pictographs are to be found in almost every country. There was no single system of pictography. Each nation or tribe, even each family or person, may have established a code for itself or may have followed no code. They may have been governed in making pictographs more by fantasy or caprice than anything else. Pictographs have been found of the highest antiquity in Asia and in Europe, while they are still employed in Africa, Oceanica, and among the North American Indians. The works of Col. Garrick Mallery in the Bureau of Ethnology are standards for the latter.

Fig. 1 of Pl. CLXII represents the engraving of the covering stone of a small dolmen at Baker Hill in Rosshire, Scotland, from Mr. Simpson. This represents the cup marking of nearly every kind, some of which have been found in almost every part of the globe.

Fig. 2 of Pl. CLXII, is an engraving on one of the granite supports of the dolmen of Petit-Mont at Arzon, Morbihan. Two human feet are represented and many undulated lines. Some of those which are continuous have been taken to be serpents, but there is no more reason for this than is shown by the lines themselves. There are two open U's, which is a common sign in that country. Another, equally common, is the crook just below the U's. They are sometimes with the crook turned to the right, sometimes to the left, and are occasionally arranged in groups, one following the other. They resemble a figure 7, sometimes placed right and sometimes reversed.

Fig. 3 of Pl. CLXII is an engraved support of the dolmen of Gavr'Inis, Morbihan. This dolmen was under a tumulus. It consisted of a rectangular chamber with a long covered entry-way extending nearly to the periphery of the tumulus. It is of granite slabs, which were nearly all engraved similar to the one shown, though not intended to be copies or exact imitations.

These are all one twenty-fifth natural size.

Pl. CLXIII represents a slab of granite one-fifth natural size from the dolmen of Gavr'Inis, Morbihan, on which is engraved in deep lines the outline of a polished stone hatchet with its handle. This has been so protected from weathering by being under the tumulus as that it is not degraded and has been cited as one of the evidences of that manner of handling the polished stone hatchet.

The display of pictographic writing at the French Exposition was as follows :

1. Marks on the dolmen of Men-er-Hroek, Morbihan, France. (Cast.)
2. Rock carving at Skebbervall, Bohuslan, Sweden. (Cast.)
3. Modern—An Indian petition claiming the possession of certain lakes. The original is in the Museum of Santiago, Chili. A cast given by Dr. Meyer, of Dresden.
- 4 and 5. Inscriptions from Easter Island, engraved on wood.
- 6 and 6a. Mayas writing from Yucatan—inscription from the steps of the temple of Palenque. From the Musée Trocadero. (Cast.)
7. Mexican writing—a mixture of pictographs and hieroglyphs. Dedication of the grand temple by Ahnitztoll.

This bas-relief represented the king laying the corner-stone. Above and below appeared the date, of which a translation has been attempted, viz: "The day 7 Rosean, 13 of the month Itzeallt Xochilluit of the year Eight Roseanx (Feb. 19th, 1487)." Cast. The original at the National Museum, Mexico.

HIEROGLYPHIC WRITING.

When the pictographic system had so progressed that each picture represented an idea, and when made after a given design, it represented the same idea continuously, the art of writing was born. This was ideography, and was thus named because it rendered the ideas of the writer, by signs, the meaning of which was fixed or had been agreed upon. The ideas to be expressed were naturally of great number, and the ideographs became complicated. It was called hieroglyphic because it was practiced principally by the priests—the hierarchy. The term "hieroglyphic" was applied first to the ancient Egyptian writing, but afterwards to all analogous systems.

The ideographic or hieroglyphic system extended to many nations or peoples, but the codes of hieroglyphs were different. The principal hieroglyphic writings were the Chinese, Egyptian, Assyrian, or Cuneiform, and Hittites in the eastern hemisphere; and the Aztecs and Mayas in the western.

The resources of language and the needs of writers caused the introduction of other signs and characters, which completed the ideographic signs and added precision to their sense. Thus it came that some of the ancient writing employed all three of the systems; the ancient Egyptian writing was at the same time hieroglyphic and alphabetic.

The first growth by which written language came into being is unknown. It is surmised that because of the needs of people for the recording of facts, or for the transmission of messages, some system



Fig. 1.

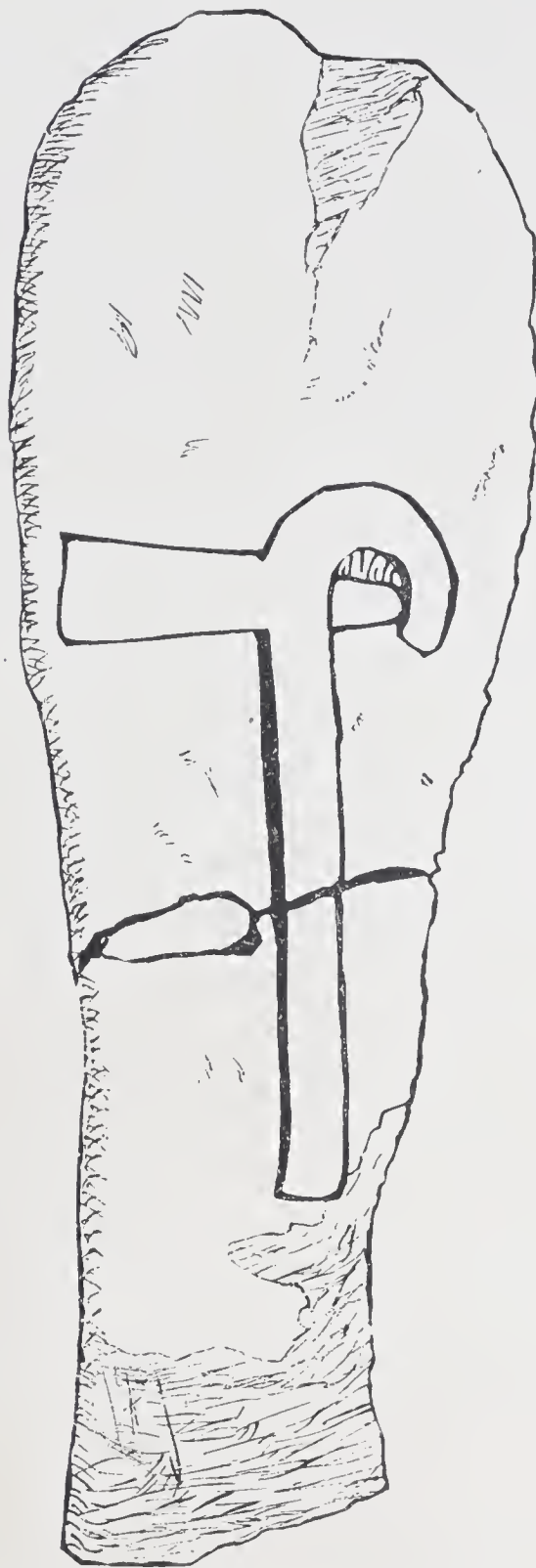


Fig. 2.



Fig. 3.

- FIG. 1. Engraving on stone of dolmen. (Ross-shire, Scotland. From Archaic sculpturing. From Simpson, Plate XIV.)
FIG. 2. Engraving on support of dolmen. (Petit-mont, Arzon, Morbihan, France.)
FIG. 3. Specimens of engravings on supports of dolmen. (Gavr'Inis, Morbihan, France.)



PICTOGRAPH. POLISHED STONE HATCHET.
(Dolmen of Gavv'Inis, Morbihan, France. One-third natural size.)

should be invented, and thus, little by little, the art of writing grew to its present perfection. In the hieroglyphic system each sign represented an idea which, being in the mind of the maker, would be recognized and understood by the reader.

For the specimens of Chinese hieroglyphic writing the visitor was requested to see the adjoining section in ethnography, where Chinese industries, arts, etc., especially that of printing, were displayed at length.

Cuneiform writing.—Cuneiform writing was, like that of the Chinese, composed in its origin of figures that have become, little by little, unrecognizable. Their primitive form is found in the most ancient Chaldean inscriptions. The principal varieties of Cuneiform writings are the Chaldean, which lasted until the fall of Babylon. The Assyrian and Persian seem to have been simplified from an Arian language.

8 and 8½. Bricks from Babylon. One bearing the seal of Nebuchadnezzar stamped in the soft brick before it was burnt. Translation—"Nebachadnezzar, King of Babylon, King of Nations, Grand King, Servant of the Great God, Restorer of the Towers and the Pyramids, I." One showing the bitumen still attached which had served as cement.

9. Assyrian writing—Obelisk of Nimrod, built by Salmanazar II, about 860 B. C.

This celebrated monument represents the kings bringing tribute and making submission to Salmanazar. Men are carrying bars of precious metal. There are the elephant, horse, camel, and gigantic apes. Among the tributaries shown in the second register is the King of Israel Jehu prostrate before the feet of the King of Assyria. Underneath is the legend: Jehona bin Omri (Jehu Son of Omri). Cast. The original is in the British Museum.

Hittite Hieroglyphs.—These are anterior to the year 1000 B. C.

10. Lion found by his excellency Hamdg-bey at Marach, Asia Minor. Cast given by the Musée of Ethnography of Trocadero. The original is at the Imperial Museum, Constantinople.

It is scarcely 20 years since the discovery of the first inscription of these characters. Since then the number has increased, but without being yet deciphered. It appears to have been used before the invention of the alphabet by the people on the borders of Syria. On this lion one can see the gross hieroglyphic characters covering its body.

Egyptian writing.—Egyptian writing is the most perfect of the hieroglyphic system. It was the forerunner of the alphabet. It is presented in three forms—the writing hieroglyphic, hieratic, and demotic. The hieroglyphs have preserved with a remarkable fidelity the primitive form of the ancient ideographs, which, on the contrary, disappear almost entirely in the hieratic and demotic writing. The latter are the forms most altered from the hieroglyphs. The most celebrated specimen of this system was the

11. Rosetta stone, with its corresponding paragraphs in hieroglyphic, demotic, and Greek, each being a translation of the other.

This was found in 1799, during the French expedition to Egypt, by an officer of artillery named Boussard. The name of the King—Ptolemy—was

recognized in each, or at least in two of the writings, and thus caused the discovery of their similarity and lead to the deciphering of the hieroglyphs by Champollion. Cast given by the British Museum, which possesses the original.

ALPHABETIC WRITING.

About the year 1500 B. C., that is about or before the time of Moses, the alphabet made its appearance among the Phœnician and afterwards among the Hebrew peoples on the Syrian coast. It would seem to have been only a simplification of Egyptian writing, adapted to the needs of commerce. The Phœnicians borrowed from the great mass of Egyptian hieroglyphics about twenty signs corresponding to the principal articulatory sounds of human speech. This was a radical transformation of the art of writing. We can believe that it was of much greater import than supposed by its discoverers. It changed for all the world and for all time the power of man over his civilization by giving him the ability to record, communicate and perpetuate his knowledge. Monsieur Renan declares the discovery of alphabetic writing to be the highest testimony of the genius of man. Capacity to utter articulate sounds is limited, so a very few characters were sufficient to record them, and it was not difficult, the discovery once made, to render all of man's ideas and to give every shade of his thought. These signs formed the alphabet of writing.

The Phœnician alphabet was modest in its commencement, but it finished by triumphing over all other systems, and has imposed itself upon all civilized peoples. It gave birth to all the semitic alphabets, from the Hebrew to the Syrian and Arabic, yet they employed only the consonants. It gave birth to the Greek alphabet in which was created the vowels, and was thereupon communicated to the Etruscans, the Latins, the Slav and Germanic peoples, and so all over Europe.

The Greeks, after some hesitation and trial, finally determined for all these languages and peoples the system of alphabetic writing from left to right. The Phœnician alphabet spread to the east and south, as well as to the north and west. It gave birth to the Aramean, to the ancient Hindoo, and so to the modern alphabets of India. Indeed, with the exception of China and Japan, and their dependencies, to all those of Asia. Whatever of ideographic or hieroglyphic writing these peoples may have employed, they, with the exception noted, only used an alphabet descended from the twenty-two letters of the Phœnicians.

The alphabetic writing descending from the Phœnician alphabet is divided into three branches:

(1) The Semitic alphabet, which is written from right to left and has no vowel. The principal of these are the Phœnician, from which is derived the Punic and Neopunic, the ancient Hebrew, the Aramean, which gave birth to the Nabatean, the Palmyrenian, the Hebrew Carrè, to the Syriac and the Arabian, and finally the alphabet Himyarite and Ethiopian.

(2) The European alphabets which are all derived from the ancient Phœnician by the intermediation of the Greek.

(3) The alphabets of India and of Pehlevi, which descended at a comparatively recent date from the Aramean.

1. SEMITIC ALPHABET.

Hebrew alphabet.

12. Pillar Daibon; with an inscription of Méša, king of Moab, about 875 B. C.

This is placed at the head because of its importance, for it is one of the most ancient alphabetic inscriptions known (but see Mr. W. Flinder Petrie's discoveries of 1859 at Kahun, in which he finds many possibly alphabetic signs of the XIIth dynasty, 2600 B. C.). One can recognize in the foregoing inscription the relationship of different Hebrew letters with those of the Phœnician and Archaic-Greek alphabets. Cast given by the Louvre Museum, which possesses the original.

Phœnician alphabet.

13. Bronze cup dedicated to Baal Lebanon (the god of Lebanon), by King Hiram, 800 to 1000 B. C. The original is at the Bibliothèque Nationale (Cabinet des Médailles).
14. An inscription engraved on one of the colossuses of Ipsamboul by a mercenary of Psammetich, 650 to 600 B. C. Cast.
15. Cyprus. Inscription bilingual, Phœnician and Cyprian of Idalie of the year 4 of the King Melekjaton, 375 B. C. Cast from the original in the British Museum.
16. Sardinia. An inscription trilingual on bronze, engraved on the base of an altar weighing 100 pounds, given to Esculapius by Clion.
17. Carthage. Punic writing anterior to 200 years B. C. An ex-voto to Tanit in form of a tower.
18. 1. *Idem.* Fragment of the tariff of sacrifices of Carthage.
2. *Idem.* A dedication of a sacred abbatoir.
3. Malta. Dedication of a temple of Gaulos.
All casts.
19. Malta. A bilingual inscription, Phœnician and Greek, which furnished to Abbe Barthélemy, about 1760, the key to the Phœnician alphabet. 200 to 150 B. C. Cast. Gift of the Louvre Museum.
20. A funeral vase from the cemetery of Hatrumète (Sousse), Tunis; with inscription painted in characters of running hand. 156 to 50 B. C.
Translation: "This urn contains the bones of Iatanmelek, son of Bomilear, son of Abdmelbari, the * * * ." Gift of Colonel Vincent.
21. Another funeral vase from the same cemetery, with painted inscription. Gift of Colonel Vincent.
22. Neopunic writing of the Roman epoch. Cabinet of *Corpus Inscriptionum Semiticarum*.

Aramean alphabet.

In its origin the Aramean alphabet is confounded with the Phœnician alphabet, which gave birth to it. But soon the tail to the letters were made longer, then were bent to the left that they might be joined to the following letters. At the same time the head of the letters became

modified, and the writing took more the character of running hand, of which we find the complete development in the Arabic writing.

23. Ancient Aramean writing in relief. Inscription of Teima, Central Arabia, discovered by Mr. Ch. Huber, assassinated at Djedda in 1884. A pillar commemorative of the installation of the cult of the god Telem of Hagam at Teima. On the left side of the pillar is the image of the god, and below, the priest, which makes him an offering upon an altar with the legend "Selemsazab, Priest." Cast, gift of the Louvre Museum.
24. An ancient Aramean inscription found by Ch. Huber at Teima.
25. Aramean inscription of the north of Arabia by Ch. Huber.
26. Aramean alphabet from Egypt. A funeral pillar from Vatican. Persian epoch 500 to 300 B. C. Cast given by M. Fr. Lenormant to the cabinet of *Corpus Inscriptionum Semiticarum*.
27. Nabatean writing, from 100 years B. C. to 300 A. D. In use by the populations of the north of Arabia before the time of Mahomet. Original, found at Teina, Arabia. By Ch. Huber.
28. *Idem*.
29. Palmyrian inscription, bilingual, from the Musée du Capitole, 236 years A. D. This is a consecration of a silver statue to the gods Aglibol and Mala'kbel. Cast. Original the property of Marquis de Vogué.
30. Palmyrian inscription. A votive altar dedicated to the god Malakbel. Musée of the Capitole. Cast. Original the property of Marquis de Vogué.
31. Hebrew Carrè, about 150 B. C. Jewish inscription from Jaffa. Fifth or sixth century A. D. Cast.
32. Arabian writing. Specimens of manuscript Coufique and Neskis, from the mosque Kairouan, Tunis.

2. EUROPEAN ALPHABET.

33. Archaic-Greek, derived from the ancient Phœnician. Treaty of the Arcadians with the *Eléens d'Hera* 600 to 500 B. C. Facsimile. The original is engraved on a bronze plate.
34. Archaic-Greek. The law of Gortyne, 500 B. C. An inscription boustrophedon, that is to say, going alternately from right to left and from left to right. Cast, gift of the Louvre Museum.
35. Etruscan inscription. Cast, gift of Louvre Museum.
36. Archaic-Latin, derived from the Phœnician by the intermediation of the Greek. Bronze plaque discovered in 1866-'67 near Gibraltar. Decree of Paul Emelie according liberty to the slaves of the Hastenses who occupied the tower of Lasceta, then the property of their town and territory. 190 B. C. Cast, gift of the Louvre Museum.
37. Trilingual inscription; Greek, Latin, and Phœnician. Engraved on the base of a bronze altar of the weight of 100 pounds. This was an offering to the great Doctor Esculapius (Esmoun Merre), by Clion. "Because he heard his voice and was cured." 150 to 130 B. C. Heliogravure from Sardinia. A cast of the original was shown in the Phœnician section, No. 16.
38. An Equestrian inscription of the time of the Republic. Cast from the Louvre Museum.

The runic characters of Scandinavia are probably the latest manifestation of the alphabetic writing in antiquity. It may be called the last fossil alphabetic writing. They had two grand epochs or divisions both of which, however, belonged to the iron age. The characters were essentially different, so much so that a knowledge of one does not enable

one to read the other. The more ancient is the most difficult. The earliest one dates from before the Christian era to about 400 A. D.; the second begins with the fifth century and continues to the beginning of history, and corresponds to the Viking period.

3. INDIAN ALPHABETS.

39. Sanscrit. Indian alphabet d'Acoka. Semitic origin which gave birth to the Dévanagari, and to all the modern alphabets of India. Third century B. C. Facsimile of inscription of Bhabra, after M. Senart, Asiatic Journal, April-June, 1887.
40. Alphabet Indo-Bactrien from the northwest of India, derived from the Aramean. Facsimile of an inscription dated the second year of Kanichka. First century A. D.

HIMYARITE ALPHABET.—*Writing of the ancient people of South Arabia from third century B. C. to third century A. D.*

41. A votive altar. Incense burner.
42. *Idem*.
43. Dedication of a statue of gold to the God Talab-Ryam by a family of Raidanites in recognition of the aid he had given to them in a war between the tribes of Saba and Raitan against their enemies the Himyarites.
44. An inscription with bas-relief. The heads of the three personages are shown. Their names are given in the inscription. Translation: Tomb of Yahmad Kachfankan, Harat, and Khalkarib.
45. Votive inscription; pedestal. *Cabinet Corpus inscription Semiticarum*.
46. Berber writing. A funerary bilingual inscription; Latin and Berber. *Corp. Inscr. Sem.*
- 47 and 48. Neopunic inscription with bas-reliefs. *Corp. Inscr. Sem.*
49. Bas-relief, fragment from Teima, Arabia. By Ch. Huber. Original.

In order to complete the chart of the ancient writing Philip Berger made an attempt at the reconstitution of a Phœnician pillar with its ornaments and accessories.

50. Reconstitution of the pillar of Byblos, Phœnicia.

This pillar bears an inscription commemorative of the construction of a portion of the temple of Byblos by the Yehaumelek. Above the inscription is a bas-relief representing the scene of the dedication. The Goddess "Lady of Byblos (Baalat Gebal)" is seated on a throne. She is represented after the character or appearance of the Egyptian goddess Hathor. Her head-dress is of two wings of the Guinea fowl which surmount two horns supporting a disk. In her left hand is a scepter, while her right is raised in sign of benediction. Opposite the king is Yehaumelek in Persian costume standing, and in the posture of prayer, offers to the goddess the "cup of deliverance." The inscription explains the scene. It enumerates the constructions made by the king to the goddess, because every time that he had invoked her aid, she had heard his prayers and had answered them for his good. The inscription terminates with a prayer of the king in which he invokes the benediction of the goddess on him and his reign. "For he is a just king."

The restorations were, first, the disk of gold surrounded by serpents that was inserted at the top of the bas-relief; second, the two horns supporting a disk which surmounts the monument; third, the traces of color on the bas-relief; the vase of libations with its two elegant handles.

This pillar is placed on two lions of stone, which were found at the same time and in the same place, and which evidently had formed part of the monument. These lions were loaned for this purpose by their owner, M. de Clereq, who kindly gave permission to make the casts of the pillar, and assisted in the reconstruction of the monument.

It might be of interest and value to continue this history of writing by quotations or condensations from the latest literature upon the subject, among which might be mentioned the history of the alphabet by Canon Isaac Taylor, Rosny's *Les Ecritures Figuratives des Differents Peuples Anciens et Modernes*, and *Essai sur la Propagation de l'Alphabet Phenicien dans l'Ancien Monde*, by M. Francois Lenormant, but the purpose of this paper being rather a report upon anthropology at the French Exposition, would not admit thereof. I can not, how-

ever, conclude this subject without calling to the attention of the reader the late discoveries made by Mr. W. Flinders Petrie at Kahun in the Fayum, Egypt, of many hundred specimens of marks or characters upon the pottery, and occasionally upon the wooden toys, ornaments, or implements found by him and assigned to the period of the twelfth dynasty, 2600 B. C., and identified by the pyramids built by



FIG. 99.—Possible alphabetic characters. (From Kahun, twelfth dynasty, Egypt. Discovered by Mr. Flinders Petrie. Probably the earliest alphabetic characters known—2600 B. C.)

Usertesen II. I have mentioned those marks in my description of these Egyptian objects purchased by me from Mr. Petrie at London, and now displayed in the National Museum. Tracings of some of them are shown in Fig. 99.

AMULETS.

The polished stone hatchet is recognized almost all over Europe as an amulet protective against lightning. It is called in many languages "the stone of lightning," or "thunder stone." This belief pervades western Europe, and it is no uncommon thing for peasants to deny any knowledge of the polished stone hatchet, because they do not know it by that name. Many of these hatchets were drilled for suspension. In this way they were intended to be carried sometimes about the neck or on the person, or occasionally are hung at the bed head or near it, with other votive offerings. When not drilled, they are put in any ledge in the stones of the fireplace, occasionally laid upon the

mantel over the fireplace, or may be inserted in a crack at the outside of the door. The general belief is that these stones come from the heavens in the flash of lightning, and one person declared that his polished stone hatchet had descended therefrom in a streak of lightning in his presence, that he had seen it strike in the neighboring field, and upon his going to the place he found the hole and extracted therefrom this hatchet, *still hot*, and that he had kept it ever since. It is needless to say that he positively refused to part with it at any price.

The flint arrowheads come within the same category, and many times a flint chip is used to which is attributed the same virtue. The arrowheads were not drilled. Sometimes they were in their original condition, but many times they were mounted in silver and the mounting arranged with a ring for suspension. Drawings of these are given in Mr. John Evans's "Ancient Stone Implements of Great Britain," in de Mortillet, Cartailhac, etc.

In Brittany a common amulet, but one of great power and regarded with great veneration, is the one called the *pierre du croix*, the staurolite by the United States mineralogists, but staurotite by the French; a mineral which crystallizes in the form of a cross, not always at right angles, but frequently so. This is regarded as a token from God in favor of the religion of the country, and is given to these his chosen people as a recognition of their piety and religious fervor. There are several quarries of these in Brittany, one near Auray. There they are gathered and mounted by the jewelers and sold as amulets. I saw in the jeweler's window in one of the streets of that town a slab of mineral containing these staurotites embedded therein in their natural state. It was about 12 inches wide and 16 inches long and had in it, if I remember rightly, forty or fifty of these specimens. It was regarded with great veneration, would not be sold at any price, but, nevertheless, was exposed in the window and served as a sign by which the owner did a good business at selling the single ones mounted.

There were others of the same nature, which are crystallized in the star shape, and they are regarded in the same way. We have in the National Museum full series of both kinds, some from the United States and others from Europe. They are considered as a talisman against shipwreck, drowning, and hydrophobia, and are a cure for sore eyes. When not mounted as a pin or a ring, they are placed in a small sachet or bag and so worn occasionally around the neck or in the pocket. They are of various sizes and lengths, from an inch down to less than a quarter.

In Italy the coral is an amulet to guard its owner against the evil eye.

These are the principal objects. The others dwindle in importance, but are, of course, considerable in number and much relied on for their efficacy and virtue.

Beads, pearls, etc., are used as amulets. Common ground glass in facets is a favorite. These are shaped as beads and are arranged on a string and usually worn as a collar. A particular one at the exposition came from Locmariaquer, Morbihan. It was endowed with great medical properties. It was a cure for diseases of the throat, diphtheria, that kind of scrofula called the *Mal du roi*, because it is believed that this disease can be cured by the *roi* (king) if he simply touches the patient. There are beads of other material. This form seems to have a high reputation in this neighborhood. They should be of different materials in the same string or collar. Those of amber are precious and are considered of great value and virtue. I have myself three or four coming from that country, a half an inch long and five-eighths of an inch in diameter, which have been worn until half the substance has gone, when the holes have been filled with lead, bushed as one might say, and a new hole drilled. The standard number of beads on a string for the greatest efficacy is seven or nine, and to make them complete one should be of rock crystal. The belief of the peasants in the virtue of these is widespread. They are passed from hand to hand where needful throughout the country. Every midwife is provided with a string of these beads, and all careful mothers will provide or hire a string of them to be worn by their children as they approach the age of puberty.

Limonite concretions (*Pierre de la grosseesse*) in the form of a hollow ball with detached pieces inside are of great virtue during gestation. The patella and similar shells are deemed of great benefit to nursing women and aiding in the secretion of the infantile food.

The common people of France, Belgium, Ireland, and other countries in Europe have a great veneration for their priests and a high regard for their religion. Therefore medals and votive offerings are employed extensively. These medals have been blessed by the mother-church and so are worn not as any particular talisman, but as an omen of good luck, a preventive against the powers of evil, and a constant reminder of one's vows to the church. They may be made in the form of a coin with a hole or ring, or they may be oval that they can bear an image of the Virgin. They are made of different metals, the most common being lead or zinc, then of silver and occasionally of gold.

The votive offerings given in thankfulness and remembrance of mercy and benefits received are many. Those, of course, could not be gathered and represented at the exposition, because they are deposited in the churches and other sacred places. Occasionally they may be found in the common churches, but the more sacred the church and the more renowned for its sanctity, the greater the number of these votive offerings. I have seen them in the church and at the spring of Madonna de la Laghetto, near La Turbie, on the mountain just above Monaco, and in the extreme southeast of France. They are to be found almost without number at the grotto and church of Lourdes in the extreme southwest of France, and I have seen them by the hundred in the church of Sainte

Anne d'Auray in the northwest of France. These votive offerings may be of almost any kind, from a picture or an illuminated writing down to the crutches and canes which have been thrown away because their need had ceased, the invalid having been cured by the miraculous interposition of the particular saint. The commonest votive offering is a representation of the particular part which had been effected and on which the cure was made. The foot, the arm, the head, or the leg may be reproduced in wax, in miniature, and suspended from the wall or framed in and around the statue of the particular saint to which the cure is ascribed. I have never counted the number thus exposed and do no more than to guess at it from their appearance. I should say of those thus exhibited at the Sainte Anne d'Auray, one thousand would be a moderate estimate. The collection of M. Bonnemere contained a number of these votive offerings from Belgium.

A favorite talisman in Brittany is a small key, cast or struck, and made usually of cheap metal, as is the medals. These keys and medals or charms represent the virtues of the different saints, and are supposed to carry with them efficacy from his blessing. They are found distributed throughout Brittany, and are for sale by the peddlers or merchants at all the fairs and *pardons* in the province. The people ascribe to each one key or medal its particular virtue. St. Eli and St. Anthony are guardian saints of all animals; St. Cornely is the guardian saint of horned cattle. On the road from Quimperlè to Pont Aven is a spring of St. Eli, and every peasant who passes gives his cattle or animals to drink of this spring. The church of St. Cornely is at Carnac, and in the harvest moon of August the cattle are driven by their owners to the churchyard and spring. They are decked with garlands and flowers and beautiful greens, and it is a grand holiday, or rather holinight. Cattle of the neighborhood, whenever sick or ailing, are driven to the well or this spring. If not able to go, the water will be carried to them.

Of the medals and coins, of which I spoke a moment ago as being sold throughout the country at the *pardons*, a particular one to be mentioned is that of St. Mathurin du Moncontour. It is in the form of a cone, round at the summit, the top of which is surmounted by a head with nimbus and terminates in a ring for suspension. It is in honor of the saint, who is supposed to have great power and authority. His chief virtue, however, would be regarded as that of self-denial, for it is generally believed that he *Aurait pu être le bon Dieu s'il eut voulu mais il a craint que cela peut-être lui causât trop de tracas*—might have been God if he had so willed, but he feared it would cause too much of a fracas.

There is told, in the Bulletin of the Société d'Anthropologie at Paris, a curious story of the curé of St. Briene, who distributed to the children of the parish some of the round ivory chips or disks used as counters for games of cards. These came in time to be regarded as amulets

which the priest had blessed and, being carried by the children, were considered as a preventive of intestinal worms in children. They are called *Olifants*, and are sold at a comparatively high price. The wife of the letter-carrier at Cornay hired hers out at *vingt cinq centimes*—5 cents a seance or day. Among other things, they will cure broken ribs.

There were three private collections of amulets, charms, and talismans displayed at the exposition, and one of divinities. The former are the property of, and were collected by, M. Joseph Belucci of Perugia, Adrien de Mortillet of Paris, Lionel Bonnemere of Belgium; and the latter by Clement Rubbens.

They numbered from four hundred or five hundred pieces in a collection down to one hundred. They were arranged in proper order and with the classification and catalogue of their respective powers and localities.

